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IS 4552-1 (1993): Automotive vehicles - Portable jacks for automobiles, Part 1 Mechanical jacks [TED 6: Automotive Body, Chassis, Accessories and Garage Equipments]



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“Knowledge is such a treasure which cannot be stolen”

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भारतीय मानक

स्वचल वाहन — स्वचालित वाहनों के लिए सुवाह्य जैक

भाग 1 यांत्रिक जैक — विशिष्ट

(पहला पुनरीक्षण)

Indian Standard

AUTOMOTIVE VEHICLES — PORTABLE JACKS
FOR AUTOMOBILES

PART 1 MECHANICAL JACKS — SPECIFICATION

(*First Revision*)

UDC 621.866-86 : 629.113

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BUREAU OF INDIAN STANDARDS
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NEW DELHI 110002

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Automotive Accessories and Garage Equipments Sectional Committee had been approved by the Transport Engineering Division Council.

This standard covering both hydraulic and mechanical type of jacks was published in 1968. In the past 24 years, due to developments of various types of vehicles, different type and capacities of jacks are now being manufactured and used. In order to cater all types of such jacks, this revision has been prepared. In view of separate requirements of mechanical and hydraulic types, these are now being covered in separate parts. Part 1 covers mechanical jacks, whereas Part 2 covers hydraulic jacks.

The Committee Composition responsible for the preparation of this standard is given at Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Indian Standard***AUTOMOTIVE VEHICLES — PORTABLE JACKS
FOR AUTOMOBILES****PART 1 MECHANICAL JACKS — SPECIFICATION***(First Revision)***1 SCOPE**

1.1 This standard covers the essential dimensions and methods of test for portable mechanical jacks commonly used for vehicles. The jacks covered in this standard may be applied from below the vehicle or from its sides or end.

1.2 Mechanical jacks up to 6 000 kg rated lifting capacity are covered in this standard.

2 REFERENCES

The Indian Standard IS 2500 (Part 1) : 1973 'Sampling inspection tables: Part 1 Inspection by attributes and by count of defects (*first revision*)' is a necessary adjunct to this standard.

3 TYPES

The jacks covered in this standard shall be of the following types and shall be either single lift or multiple lift:

- a) Bottom Lifting Jacks
 - 1) Bottom lifting, mechanical, screw (single or double) spindle type (BMS)
 - 2) Bottom lifting, mechanical, scissor type (BMX)
- b) Side/End lifting, mechanical type (SM)

4 MATERIAL

The material used for jacks shall be as per agreement between the manufacturer and the purchaser.

5 DIMENSIONS AND OPERATING TORQUE**5.1 Dimensions**

The functional dimensions of bottom lifting jacks and side lifting jacks shall be as given in Tables 1 and 2 respectively. For scissor types of jacks, the figure shown in Table 1 shall be taken schematically.

5.2 Operating Torque

The operating torque required for lifting maximum load as applicable, either by rotating the operating spindle or by up and down movement

of the operating lever, shall not exceed the limits given in Tables 1 and 2.

6 GENERAL REQUIREMENTS

6.1 The jacks shall be provided with a square end on the operating spindle as shown in Tables 1 and 2.

6.2 Each jack shall be provided with an operating lever and lift shall be achieved as single or multiple.

6.3 The top of the saddle of bottom lifting jacks shall be suitably shaped with chequered or serrated surface to prevent slipping.

6.4 For jacks with rated capacity of 6 000 kg a suitable handle for lifting/carrying the jack, shall be provided.

6.5 Strength and other essential physical properties of the component parts of the jack shall be adequate for purpose intended. All castings, which shall be in accordance with the appropriate Indian Standard, shall be of uniform quality, free of blow holes, porosity, hard spots, shrinkage, cracks or other deleterious defects which might adversely affect the intended use. Processes such as peening or plugging shall not be used on castings or forgings reclaiming any part of the jack.

7 TEST SCHEDULE FOR MECHANICAL JACKS**7.1 Type Tests**

Five jacks shall be supplied for type tests for the following tests. The No. of jacks to be tested for each test shall be as given in Table 3.

7.1.1 Visual Test

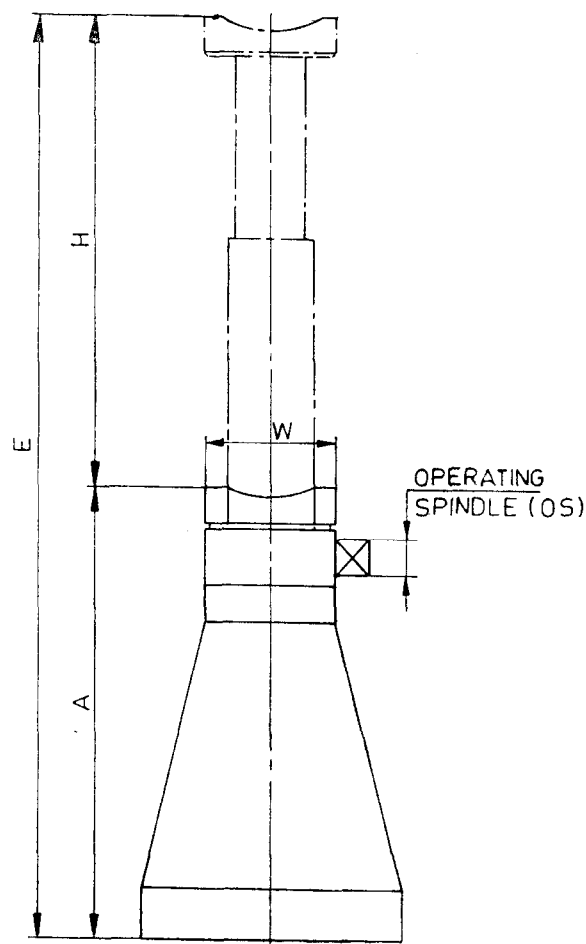
All the jacks shall be free from defects such as cracks, blow holes, etc.

7.1.2 Dimensional and Material Check

Five jacks shall be subjected for detailed dimensional check and one jack for material check as per the applicable drawings.

Table 1 Requirements for Bottom Lifting Portable Jacks
(*Clauses 5.1 and 5.2*)

All dimensions in millimetres.



Rated Lifting Capacity	1 000 kg Low Lift	1 000 kg High Lift	2 000 kg	4 000 kg	6 000 kg Low Lift	6 000 kg High Lift
Maximum closed height, <i>A</i>	170	120	195	195	130	230
Minimum total lift, <i>H</i>	180	330	250	250	180	270
Minimum extended height, <i>E</i>	350	450	445	445	310	500
Saddle width/Dia, <i>W</i>	50	50	65	80	100	100
Connection for operating spindle, <i>OS</i>	14 ^{-0.2} Square	14 ^{-0.2} Square	14 ^{-0.2} Square	14 ^{-0.2} Square	17 ^{-0.2} Square	17 ^{-0.2} Square
Maximum torque for operating the spindle in kgf.cm	250	250	250	350	500	500

7.1.2.1 Tests

Second jack shall be subjected to the following tests in sequence as given for ascertaining their conformity to this standard. The jacks shall either be tested on actual vehicle/trailer or on a rig simulating operating of jack on a vehicle. In these cases the jacks shall be subjected to tilted loads up to $\pm 5^\circ$ angle.

7.1.3 No Load Test

Jacks shall be operated without load to its maximum position and back and shall work smoothly without undue clearance between the moving parts.

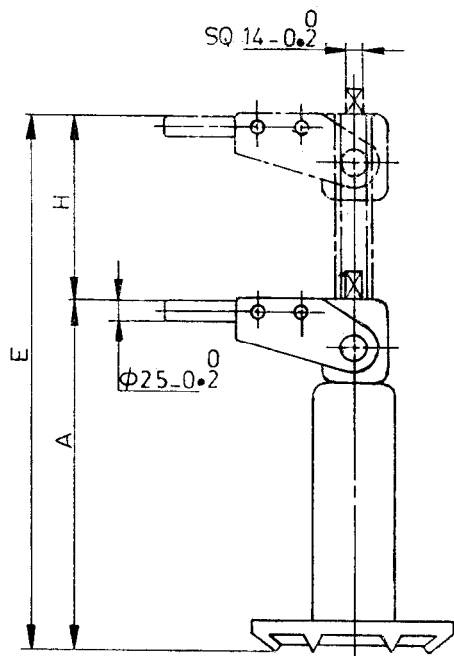
7.1.4 Overload Test before Performance

Jacks shall be loaded with a load of 120 percent and operated from the minimum to maximum

position and back. During this, the jack shall operate smoothly throughout the range without any slip or other visible damage.

Table 2 Requirements for Side Lifting or End Lifting Mechanical Jacks
(Clauses 5.1 and 5.2)

All dimensions in millimetres.



Rated Lifting Capacity	500 kg	1 000 kg	2 000 kg
Maximum closed height, <i>A</i>	450	450	450
Minimum lift, <i>H</i>	240	240	240
Minimum jack-up height, <i>E</i>	690	690	690
Maximum torque for operating the spindle, kgf. cm.	180	250	250

7.1.5 Performance Test

Jacks shall be loaded with a load of rated capacity and operated from the minimum to the maximum position and back. After repeating the cycle 100 times, the jacks shall work smoothly throughout the range without undue play or slip between the moving parts.

7.1.6 Overload Test after Performance

The test as given in 7.1.4 shall be repeated.

7.1.7 Operating Torque Test

This test shall be carried out by loading the jacks to its rated capacity and torque required at the end of handle may be measured either by torque wrench or any other suitable means. The maximum torque for operating the spindle shall be as shown in Tables 1 and 2.

7.2 Acceptance Tests

The following shall constitute acceptance tests:

- Visual Test (see 7.1.1)
- Dimensional Check (see 7.1.2)
- Material Check (see 7.1.2)
- No Load Test (see 7.1.3)
- Overload Test before Performance (see 7.1.4)
- Performance Test for 25 Operations only (see 7.1.5)
- Operating Torque Test (see 7.1.7).

8 SAMPLING

8.1 Sampling scheme for different tests shall be followed as below:

- | | |
|-----------------|------|
| a) Visual Test | 100% |
| b) No Load Test | 100% |

Table 3 Sequence and Number of Jacks to be Tested for Type Tests
(Clause 7.1)

Sl No.	Type of Test	Clause Ref	Jacks Serial Numbers				
			1	2	3	4	5
1.	Visual test	(7.1.1)	×	×	×	×	×
2.	Dimensional Check	(7.1.2)	×	×	×	×	×
3.	Material Check	(7.1.2)		×			
4.	No Load Test	(7.1.3)	×	×	×	×	×
5.	Overload Test before Performance	(7.1.4)			×	×	×
6.	Performance Test	(7.1.5)				×	×
7.	Overload Test after Performance	(7.1.6)				×	×
8.	Operating Torque Test	(7.1.7)			×	×	×

- | | |
|--|--|
| c) Overload Test before Performance | 100% |
| d) Performance Test for 25 operations only | } Suitable sampling plan as per IS 2500 (Part 1) : 1973, inspection level IV, AQL 1.5% to be followed. |
| e) Operating Torque Test | |
| f) Dimensional Check | At least one sample or 1% whichever is more |
| g) Material Check | Representative samples of raw materials procured and used in manufacture of finished jacks be tested to ensure that the same conform to the specifications stipulated in the applicable drawings |

9 DESIGNATION

9.1 The jacks shall be designated by:

- Type,
- Lift (also state low or high as applicable),
- Nominal lifting capacity in kg.

Example:

Lifting mechanical jack (Type BMS), having nominal lifting capacity of 6 000 kg, shall be designated as:

Jack BMS 6 000 High lift

10 MARKING

10.1 Jacks shall be legibly and indelibly marked, punched or embossed with:

- Indication of the source of manufacture,
- Words HIGH LIFT or LOW LIFT,
- Rated lifting capacity in kg, and
- Year of manufacture.

11 PAINTING AND PRESERVATION

All exposed surfaces of jacks shall be well protected from corrosion and the wearing surfaces/parts shall be greased.

12 PACKING

Packing of jacks shall be done suitably to avoid damage during transit.

ANNEX A

(Foreword)

COMMITTEE COMPOSITION

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